

**Before the
Federal Communications Commission
Washington, D.C. 20554**

In the Matter of)	
)	
Amendment of Part 15 regarding new requirements)	
and measurement guidelines for Access Broadband)	ET Docket No. 04-37
over Power Line Systems)	
)	
)	

To: The Commission

Comments of Frank A. Lynch

The following are comments of Frank A. Lynch, 2528 Oakes Plantation Drive, Raleigh, NC 27610. I am a senior RF engineer at Nortel Networks, holder of a FCC Commercial General Radio Telephone License (GROL), and an Amateur Extra Class Radio Operator, W4FAL. I currently hold two patents related to telecommunications devices and/or techniques. I have over thirty years of experience in the communications industry in the following areas; AM Broadcasting, FM Broadcasting, TV Broadcasting, Radio Common Carrier and Private Carrier Paging, Land Mobile Communications, Cellular, and Point-Point Microwave Systems.

I live in Raleigh, NC. Progress Energy is conducting a trial in southern Wake County at two different locations. Both of these locations use BPL equipment manufactured by Amperion and both locations use both overhead and underground instances of Access BPL. I have visited the trial locations many times since January of this year when the system was first activated, including once during the visit of Chairman Powell and his staff to observe the system. I will add again as I did in a previous comment and complaint, that myself and several other amateurs present, offered to show the Chairman as well as members of his staff the interference we were concerned about. On that day in question, it was so bad on 10-meters that we were unable to communicate between two mobiles each running 100 watts that were less than 2 miles apart.

I have seen several references in trade journals, industry forums, and elsewhere that there is a general perception at the FCC that notching has been an effective tool for mitigation of BPL signal interference to Amateur Radio. It has NOT.

Having observed this trial system, which at times has operated on frequencies as low as 3.5 MHz and as high as 32 MHz over the past 10 months, this just isn't so. Notching as implemented in the Amperion system has not been effective in eliminating interference to the amateur spectrum as observed on a mobile unit with what even under the best of circumstances uses an antenna system on the frequencies in question that is inferior to what a fixed amateur station would have if one were in the trial areas.

Local amateurs have been characterized by Progress Energy that we cannot be satisfied and that we've constantly "raised the bar" each time they have done anything in an attempt to mitigate interference.

Progress Energy and their vendor, Amperion, used notching to reduce the BPL signal level on two of the overhead lines involved in their trial. As recently as a few weeks ago, I along with Thomas Brown, N4TAB drove to both sites. We were still able to hear BPL emissions with a typical amateur mobile HF

setup as much as a mile from one location. In fact, each and every time I've visited the sites; I have always been able to find BPL spectrum in use on several of the amateur bands as well as non-amateur allocations (including short-wave broadcast).

In their investigation, the FCC's OET reported that "Measurements and observations with test equipment and a high quality amateur receiver show little field strength or observable signal levels in the notched bands." It's a shame that they never contacted Mr. Brown for whom they were acting on his complaint, to accompany him to the site and show them what he was hearing. They were reportedly in the area for almost as week. If they indeed weren't able to hear BPL emissions at a level that obscured amateur communications (which one can hear most any time of day), I can only assume that they (a) didn't know how to operate the equipment or it was faulty, (b) that Progress Energy altered the BPL emissions levels while the FCC was in the area making the tests, or (c) that more than a dozen amateur operators in the area who have visited the trial area to observe this system, many of whom are Electrical Engineers with a combined vast amount of experience simply don't know what we're doing. I ask you to be the judge. Something doesn't add up.

My experience has been that I could easily hear the BPL signals inside the notched bands. The signals were weak, but they were strong enough to cause harmful interference to other weak Amateur Radio signals, and were annoying to listen to while following the common Amateur Radio practice of tuning across our band looking for signals from other Amateur stations.

A few points to add:

We keep pointing out that there were no Amateur Radio operators living inside the Progress Energy trial area. At the onset of the trial many of us considered ourselves lucky. In retrospect I wish that there had been amateurs living in the trial area. Our mobile observations were intended to be representative of the fixed stations that will be encountered in a general roll out of the system used in the trial (albeit with the reduced efficiency of mobile antennas).

Extrapolating from our mobile observation, in a general roll out the notched signals would cause harmful interference to fixed stations within a several blocks of the power line. This was demonstrated in practice by Jim Spencer in Cedar Rapids, Iowa, whose home was about 500 feet from the Amperion trial system in that city. After months of trying, Amperion was unable to reduce the signal at his home station below a clearly harmful level. Allient Energy cited the interference as one of the factors that caused them to end the trial early.

In attempting to move and notch spectrum to mitigate interference, Amperion demonstrated only limited control of their hardware. In general the mitigation has been more about moving the BPL spectrum to another frequency (what I call the shell game) and less about notching which still doesn't reduce the signal levels so that they can't be heard on a normal amateur receiver.

In their first change on the overhead line feeding the Holland Meadows subdivision south of Raleigh, they attempted to place a BPL signal across the spectrum that lies between the 20 and 15-meter Amateur bands, with a notch across the 17-meter band. They "missed the mark" at the low end of the spectrum block and ended up with a full-strength signal across the top 60 kHz of the 20-meter band (from 14.290 to 14.350 MHz).

Despite several complaints to Progress Energy and the FCC, this signal remained in place **from May until August 2004!** When it was finally moved, a few weeks before the system was shut down completely, Amperion's limited control caused them to push the BPL signals up the spectrum and cover the bottom 100 kHz of the 15-meter band with a full-strength signal (while they did clear the top 60 kHz of the 20 meter band).

The FCC's OET investigation inexplicably failed to document this signal, even though it was prominently mentioned in the complaint he was responding to (it was still in the 20 meter band when he observed the trial in late June, 2004). Why?

The Amperion BPL system does not contain itself to the intended spectrum blocks. Rather, signal "spills out" into adjacent spectrum. These overlapping signals are weaker than the main signal, and fade slowly as one tunes across the spectrum away from the edge of the main signal block. I can hear it well for 50 to 100 kHz from the edge of their main blocks, carrying the signals well into the adjacent Amateur Radio bands. The signal level is similar to the notched band signals. Again, the problem will be magnified for fixed stations near the lines. A less efficient mobile can only demonstrate that the problem exists.

Absolutely no consideration has been given to interference to international short-wave broadcast (SWBC) reception. Several specific references to such interference have been noted (one of which was copied in whole in the complaint filed by Tom Brown N4TAB, investigated by James Burtle). None of the SWBC bands are notched in any way, and weak to moderately strong SW signals are obliterated by the BPL signal when my vehicle is in the vicinity of the power line.

CONCLUSION

To date, on whatever spectrum the BPL signals have been placed, they have been easy to find and were heard for a considerable distance by an average equipped amateur mobile station. I have seen NO demonstration that BPL can be made to work without significant radiation in whatever portion of the HF spectrum it operates in. This should come to no surprise to anyone with even a moderate amount of education in physics or engineering (which I hope we still have at the FCC). The power lines make for a pretty good antenna.

Respectfully submitted,

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